….Airplanes As a Network….
Information Connectivity in Aviation

Societal Trends – NOW Is The Right Time To Create The NETWORK IN THE SKY

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Sometimes things go your way and just drop into place…..

Today We Stand at the Intersection of Emerging Societal Trends ….things are going our way!

- Businesses must reduce costs and increase revenue
- “Digitizing”
- Proliferation of wireless network connectivity
- Personalized information services (web2)
- Mobile routing
- A new generation of small aircraft for transportation
- The creation of industry standards

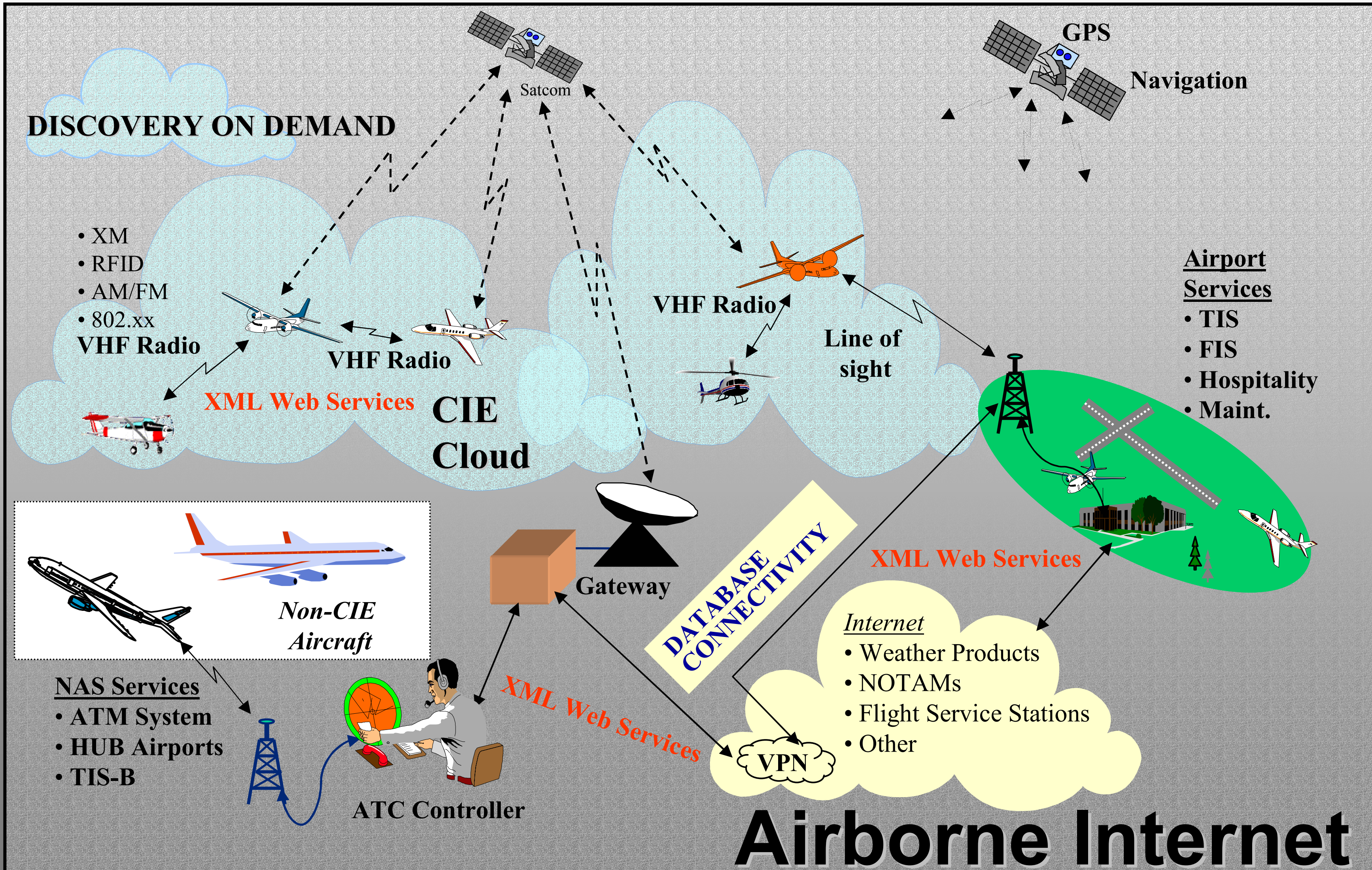
AIRBORNE INTERNET/Collaborative Information Environment

What IS this thing?

A concept that overlays network theory and principles into the transportation realm

…Information CONNECTIVITY ….A scalable, general purpose, multi-application data channel for people (and cargo) in transit

Collaborative Information Environment
“Meet us in the cloud”



Original graphic courtesy of Computer Networks & Software, Inc.

Airborne Internet Value Proposition

A general purpose, multi-application data channel represents the opportunity to:

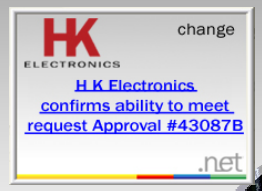
1. **Consolidate flight deck functions to reduce equipage**
   - **in the aircraft (aircraft owner *saves money*)**
   - **On the ground (FAA *saves money*)**
2. **Create a NEW revenue stream for air carriers that does not exist today (operators *make money*)**

Information Connectivity:

Agile Business Process

Employees Connected

- Why not aircraft, crew, maintenance, operations, security?
- Air Traffic Management?
- Example: MyBoeingFleet.com served >400GB of data using XML



Aviation Information of the Future

…..and eventually, pilots will be able to extract data using *VOICE….on the Airborne Internet/CIE*.

- Voice Extensible Markup Language (VoiceXML) allows a user to interact with the network through voice-recognition technology by using a voice browser
- W3C (the WWW Consortium) is currently writing version 2.0 of VoiceXML standard
  - Editors are from PipeBeach, Nuance Communications, Speechworks International, Lucent, Motorola, IBM, and Tellme Networks

XML Web Services

Industry standards for interoperability

Enable disparate systems to work together

- Across languages, platforms, applications
- Computer to computer
- Inside/outside the firewall

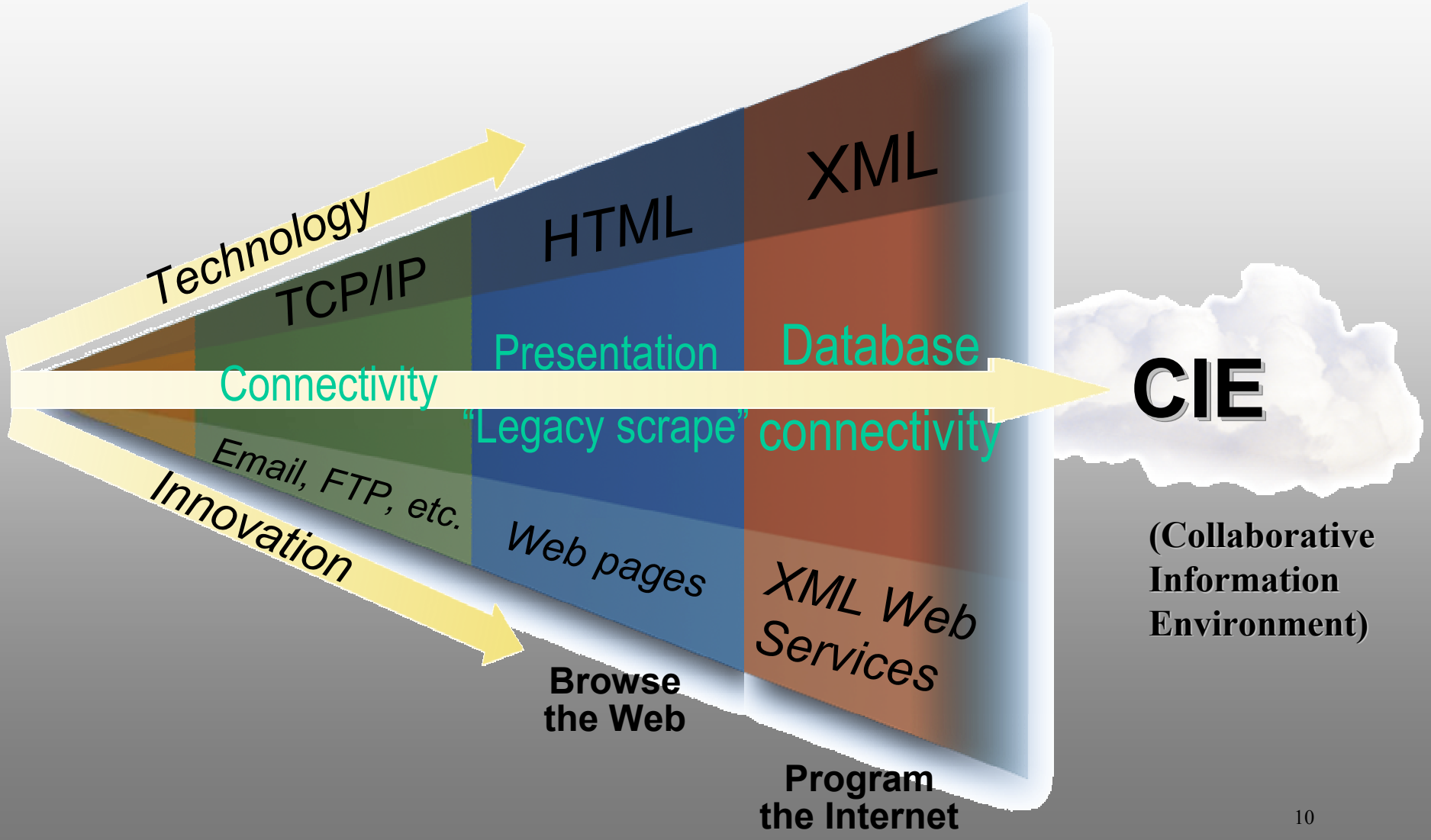
Based on open, internet standards

- XML, SOAP, WSDL, UDDI

Broad industry support

- Key area of vendor alignment

XML Web Services:
Next wave of Information Evolution

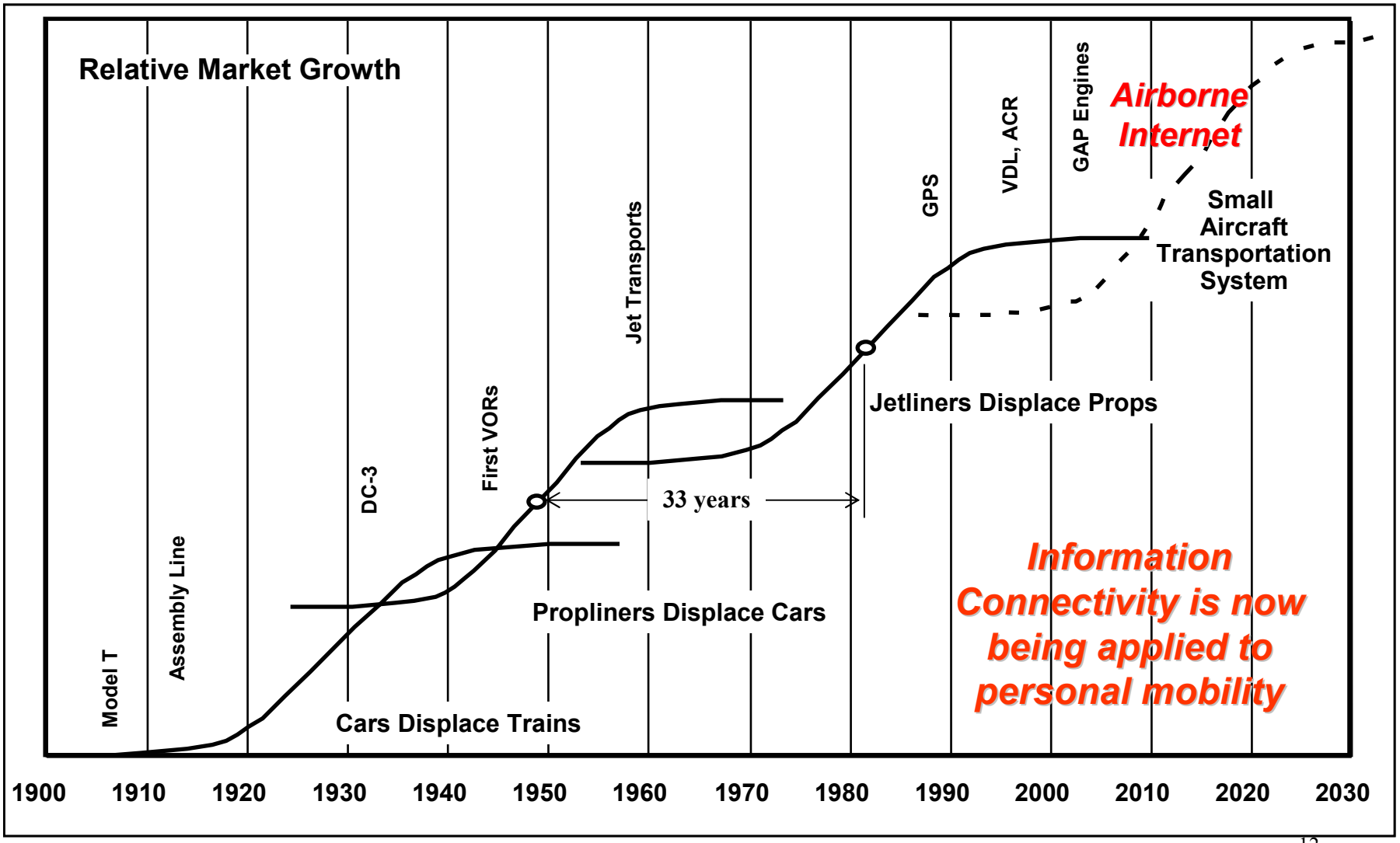


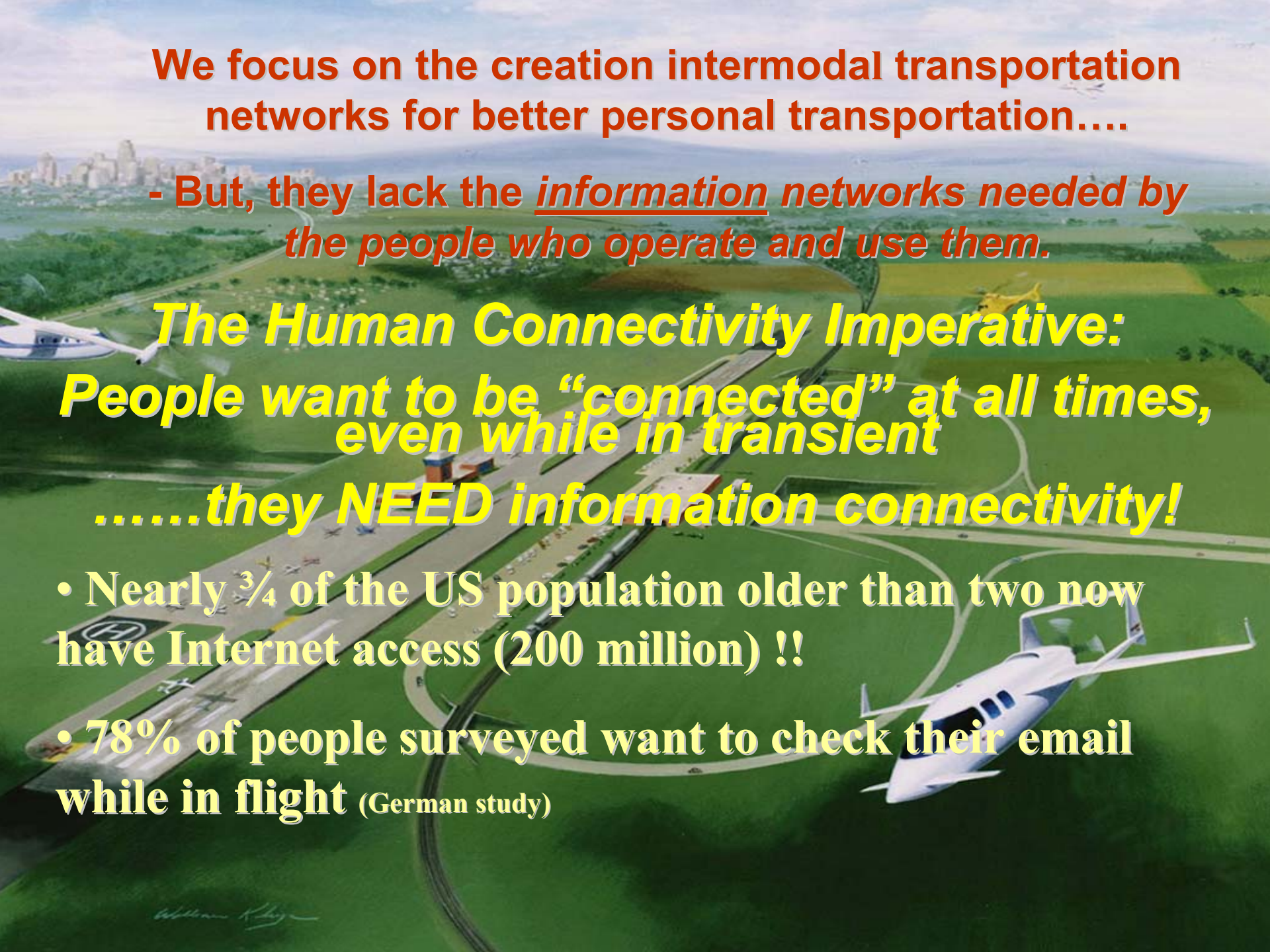
Yes, we know there are some challenges…..!

…but we believe these challenges can be met.

We can capitalize on the trends of the IT world and bring *information connectivity* to the flight deck

Disruptive Innovations in Higher Speed, Longer Daily Range Travel and Information Connectivity





We focus on the creation intermodal transportation networks for better personal transportation….

- But, they lack the *information* networks needed by the people who operate and use them.

The Human Connectivity Imperative:

People want to be "connected" at all times, even while in transient

…….they NEED information connectivity!

- Nearly ¾ of the US population older than two now have Internet access (200 million) !!
- 78% of people surveyed want to check their email while in flight (German study)

Functional Picture of the SATS Collaborative Information Environment (SATS_CIE)

Communications Channels – RF, IR, FM, XM, Satellite

O/S, Products & solutions

 **Engine**	 **Cockpit**	 **Cabin**
Maintainer	Pilot	Passenger
MX	INFO	TAINMENT

Aviation Information of the Future

Airborne Internet replaces stovepiped cockpit technology

Yesterday – many types of communication & navigation links

VHF voice comm

VOR LOC / Glideslope

Mode S Transponder

DME

ADF

Today – consolidation…

…however, applications are still stovepiped

Avidyne FlightMax Entegra

Garmin GPS / NAV / COM

Control Vision Anywhere Map

XML Data Services

Tomorrow – interoperability…

Airborne Internet "cloud"

…information anywhere, anytime, and on any device

CIE is the path to real time information connectivity

Graphic courtesy of CD3Aero

Result of the Traditional Method of Deploying New Systems in Aviation

How did it come to this?

***Result* of the Traditional Method of Deploying New Systems in Aviation**

How did it come to this?

- **Analog radio technology at the time**
- **Did not have today's digital transfer technology**
- **Did not have secure mobile routing technology**
- **Did not have "multi-function displays"**
- **Did not have data warehouses and broadband**
- ***Did not have a general purpose, multi-application data channel***

The Cockpit of the future…….?

NASA SATS aircraft interior conceptual drawing

….digital systems require *DIGITAL CONNECTIVITY !*

….or Cockpit of Today !

Eclipse 500 interior from www.eclipseaviation.com

Microjets, Small Airports, and Travel

Eclipse 500

HondaJet

~$1 million, 3000’ runways, $.75/mile operating costs, 6 pax

Will be the core of a new revolution of air travel

The AIRBORNE INTERNET COLLABORATION GROUP

Involving the Industry

Create an Industry sponsored consortium to advance A.I./CIE

- **Attracts industry funding**
- **Gov't can contribute**

- **Trend: Consortiums develop industry standards faster than standards developing organizations (Cargill)**

INDUSTRY EFFORTS IN A.I.

The Airborne Internet Consortium

Industry sponsored consortium to advance A.I./CIE

- **Develop <u>open</u> standards, GS&Cs**
- **Industry funded, Gov't can contribute**
- **7 meetings in the last 15 months**
- **Developed an A.I. Work Plan ($30 Million)**
- **Public-private collaboration - 501(c)3**
- **Microsoft, Boeing-ATM, Aerosat, Northrop Grumman, NASA, FAA, ARINC, SITA, VA SATSLAB, Ohio Univ., ERAU and others**

The Time is Perfect for A.I.C. to be created Because of the New JPDO

- JPDO looking for a communications solution for national transportation policy
- JPDO recognizes the imperative for communications in the next generation transportation system
- JPDO is looking to partner with industry to gain advantage from industry investment

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Network In the Sky

Every aircraft is a network node

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http://www.AirborneInternet.com

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